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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/540,168

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Burkhard Kohler

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NORRIS, MCLAUGHLIN & MARCUS, PA
875 THIRD AVENUE
18TH FLOOR
NEW YORK, NY 10022

EXAMINER

HAQ, SHAFIQUL

ART UNIT

PAPER NUMBER

1641

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/540,168	KOHLER ET AL.	
	Examiner	Art Unit	
	Shafiqul Haq	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received:
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/17/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Continuing data including §371 date is not mentioned in first paragraph of specification. Applicants are advised to mention continuing data in first paragraph of specification that agrees with the continuing data on Bibliographic Data Sheet.
2. NPL and foreign patent documents cited in IDS have not been considered because copies of those documents were not provided. In order to be in compliance with MPEP 609, III, A (2), applicants must provide copies of all of the references cited in the IDS. These references will become part of the official file of this application. Upon receipt of the missing documents, they will be considered by the examiner when preparing the next office action and a signed copy of form PTO-1449 will be provided with the next office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. With respect to claim 1, the term "trowing the nanoparticles" is confusing. "Growing" with respect to what (size, weight)?
6. Claim 1 recites the phrase "synthesis mixture" in line 3. The components (i.e. composition) of the synthesis mixture is unclear. Claim 1 also recites the term

“synthesis period”. It is unclear what “length of time” is encompassed by the term “synthesis period”.

7. Claim 1 recites the term “modifying reagent”. The chemical nature and structure of the modifying reagent is unclear.
8. Claim 1 recites the phrase “exhibiting a functional property which is suitable for a subsequent use of the nanoparticle”. It is not clear what suitable functional property is intended to encompass in this claim.
9. With respect to claim 3, the term “optionally in combination with magnesium” is not a positive recitation and the term may be interpreted as the magnesium not being a required component of the claimed invention.
10. Claim 3 recites the phrase “all of which can also, in addition, be doped with one or more elements of lanthanides”. “Can also” is not a positive recitation and it may be interpreted as additional doping with one or more elements of lanthanides and/or Mn, Ag, Cu, Pb, Bi, Cr, Sn or Sb not being a required component of the claimed invention.
11. claims 4, 14 and 15 lack antecedent basis for the term “the concentration of doping elements”.
12. Claim 5 recites the phrase “wherein the subsequent use comprises the dispersion of the modified nanoparticles in a solvent which is specially selected with a view to the application”. It is not clear what solvent is meant by the terms “solvent which is specially selected”? The claim is also unclear as well as confusing for the phrase

“with a view to the application”. It is unclear what is intended to accomplish by the phrase “with a view to the application”.

13. Claim 6 recites the phrase “also exhibits a growth-controlling function”. The term “also” implies that modifying reagent have other function besides “growth-controlling function”. The other function of the modifying reagent is not clear.

14. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

15. Claims 1-3 and 13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling only for process of preparation of nanoparticles such as $\text{LaPO}_4\text{:Ce,Tb}$ and $\text{LaBO}_3\text{:Ce,Tb}$, do not reasonably provide enablement for enablement for enormous number of nanoparticles claimed in claims 2 and 3. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specification provides working examples only for the preparation of metal salt nanoparticles comprising metal salt such as LaPO_4 or LaBO_3 doped with Ce and Tb (e.g. $\text{LaPO}_4\text{:Ce,Tb}$ and $\text{LaBO}_3\text{:Ce,Tb}$) (see pages 19-21) and an undue experimentation would be required to prepare the enormous number of nanoparticles that comprises wide number of structurally and functionally distinct metal salt doped with a large number of lanthanides and other elements. Undue experimentation would also be needed to monitor and judge reaction progression

(growing of nanoparticle) and applicability of different modifying agent with respect to the composition of the nanoparticle. The invention as claimed require undue experimentation due to the quantity of experimentation necessary; limited amount of guidance and limited number of working examples in the specification; nature of the invention; state of the prior art; relative skill level of those in the art; predictability or unpredictability in the art; and breadth of the claims. In re Wands, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

16. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: synthesizing steps such as mixing different components of nanoparticle (e.g. host material and doping materials), growing steps such as allowing reaction to proceed before adding modifying agent. Adding and mixing host material with doping material is essential to the synthesis of nanoparticle and as described in specification timing of addition of modifying agent to synthesis mixture is critical for crystal growth and for obtaining a desired sized nanoparticle.

17. Claim 11 provides for the use of compounds of formula IV for preparation of nanoparticles, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Art Unit: 1641

18. Claims 12 provides for the use of nanoparticles for coupling to biological molecules, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

19. Claims 13 provides for the use of nanoparticles for subsequent intended application, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 101

20. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

21. Claim 11 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

22. Claim 12 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper

Art Unit: 1641

definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example Ex parte Dunki, 153 USPQ 678 (Bd.App. 1967) and Clinical Products, Ltd. v. Brenner, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

23. Claim 13 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example Ex parte Dunki, 153 USPQ 678 (Bd.App. 1967) and Clinical Products, Ltd. v. Brenner, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

24. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

25. Claims 1-3 and 5-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Haubold et al (US 2003/0032192A1).

Haubold et al disclose synthesis of metal salt nanoparticles (paragraphs [0001] and [0021]) comprising synthesizing the nanoparticle in a synthesis mixture (paragraph [0022]) and growing the nanoparticle wherein growth of the nanoparticle

Art Unit: 1641

is controlled by growth controlling element (i.e. modifying reagent. e.g. phosphororganic compound, an amine compound, monoalkyl amine, dialkyl amine etc.) (paragraphs [0023], [0041], [0056], [0074-0076], [0115-0116] and [0134]) suitable for subsequent use of the nanoparticles after synthesis.

As for claims 2-3, Haubold et al disclose nanoparticles in which host material can include compounds selected from phosphates, halophosphates, borates, aluminates, silicates, molybdates and germinates ([paragraph 0021]), all of which can also, in addition, be doped with one or more elements of lanthanides and/or Mn, Ag, Cu, Pb, Bi, Cr, Sn or Sb (paragraphs [0105], [0108-0111]).

Therefore, the reference is deemed to anticipate the cited claims.

Claim Rejections - 35 USC § 103

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

27. Claims 4 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haubold et al.

See above for teaching of Haubold et al.

Haubold et al differ from the instant invention in failing to teach different concentrations of doping elements in host lattice.

As evidenced from the requirement of a wide range on concentration of doping elements (see claims 4 and 14-15), the concentration of doping elements in host

lattice is not critical to the practice of this invention and the optimum concentration of doping elements in host lattice can be determined by routine experimentation and thus would have been obvious to one of ordinary skill in the art to discover an optimum value of a result effective variable. "[W]here the general conditions of claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." Application of Aller, 220 F.2d 454,456, 105 USPQ 223, 235-236 (C.C.P.A. 1955). "No invention is involved in discovering optimum ranges of a process by routine experimentation." Id. At 458,105 USPQ at 236-237. The "discovery of an optimum value of a result effective variable is a known process is ordinary within the skill of the art." Application of Boesch, 617 F.2d 272,276,205 USPQ 215, 218-219 (C.C.P.A. 1980).

Conclusion

28.The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Hoheisel et al., US Patent Application Publication Number 2004/0014060 A1, disclose nanoparticles comprising a wide variety of host materials doped with lanthanides and other metals but do not disclose modifying reagents (i.e. growth controlling elements) in the preparation of nanoparticles.


29.Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shafiqul Haq whose telephone number is 571-272-6103. The examiner can normally be reached on 7:30AM-4:00PM.

Art Unit: 1641

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SHAFIQUL HAQ
EXAMINER
ART UNIT 1641


LONG V. LE 05/12/08
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ART UNIT 1641